

Response to the Proposed U.S. Supervisory Guidance
for Retail Credit Risk Capital under the Basel II Framework

The RMA Capital Working Group

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A. Introduction and overview.

This paper represents the response of the RMA Capital Working Group¹ to the October 27, 2004 interagency notice regarding Internal Ratings-Based Systems for Retail Credit Risk for Regulatory Capital (referred to as the “Retail Guidance” or “RG”). The paper is intended to represent a fairly complete list of Group concerns regarding implementation issues as well as other, more policy-oriented, issues. Therefore, in some cases, language regarding an issue has been copied verbatim from previous Group responses to U.S. regulators. Additionally, at the invitation of agency staff, we have included some important issues that pertain to commercial lending treatment – issues that may have arisen in the June, 2004 Basel Framework itself or with respect to the previously issued U.S. “Wholesale Guidance”. We greatly appreciate this opportunity to raise or repeat our most important concerns prior to the formulation of the Notice of Proposed Rulemaking scheduled for mid-2005. As always, we remain stalwart supporters of the Basel II reform process.

We should like to note at the outset our concern over the degree of prescriptiveness within the Retail Guidance document – a concern which was evident as well within the Wholesale Guidance. Examples of over-prescriptiveness include the quarterly updating of risk parameter estimates (compared with yearly updating within Wholesale) and the detail associated with segmentation procedures. Perhaps a half of the “RS” standards within the Retail Guidance could be transformed into general guidance or examples of good practice rather than strict supervisory “expectations.” We view the current diversity of practice across AIRB banks as a healthy indication of rapidly evolving risk measurement procedures, and we remain concerned that there will be a chilling effect on improvement in best practices flowing from attempts to impose consistency. For this reason we have tried to present a view, within each of the issues below, of the diversity of practice among our member institutions.

A very brief summary of our major concerns is as follows:

- Frequent updating of risk parameter estimation is unnecessary to proper computation of regulatory capital and can be very costly.
- The “unseasoned” retail loan capital requirement (via use of annualized cumulative PDs) is inconsistent with the rest of the Basel framework, may be costly to implement, and may result in inappropriate incentives to sell rather than to hold unseasoned loans.
- The RG definition of default could be appropriately liberalized by allowing banks to choose a Days-Past-Due definition that is prior to or after non-accrual or charge-off status. The effect on Basel capital would be minor but the cost saving effect could be significant.
- Regulators should be flexible and liberal in their acceptance of an AIRB bank’s methodology for arriving at a downturn LGD (“DLGD”). In particular, it would

¹ The Capital Working Group of The Risk Management Association consists of senior risk management officers at large banking organizations responsible for the measurement of risk and the determination of Economic Capital. The names of the institutions represented on the Capital Working Group, along with staff members contributing to the preparation of this memorandum, are shown in an Appendix. Individual banking organizations that are members of the Group may be responding separately to the Retail Guidance, and may hold opinions regarding Basel II that differ from those expressed in this paper.

be inappropriate to establish particular historical time periods as constituting the “peak” of DLGDs. Further, consideration should be given to a “diversification” effect of DLGDs – that is, for a given “bad draw” of the macro risk factor, neither individual products nor individual banks will experience the peak DLGD at the same time.

- Basel regulators could appropriately assign several retail products to lower AVC structures. Such treatment would be appropriate for HELOCs-home equity term loans, small business credit cards, revolving lines to small businesses utilizing partners’ homes as collateral, and loans to owners of multi-family residential buildings.
- The loss volatility test for an AIRB bank to assign its credit cards to the Qualifying Revolving Exposure (“QRE”) category should be based on, and be consistent with, the degree of loss volatility, for a given PD and LGD, generated by the Basel credit card risk model itself.
- Compliance costs may be significantly reduced for some AIRB banks if accrued interest and fees were to continue to be assigned a 100% risk weight (as is the case under the current Accord). At the bank’s discretion, this conservative treatment could be permitted in lieu of counting accrued interest and fees within the exposure amounts.
- The rules for assigning, validating, reviewing, and updating the definition of retail segments are overly prescriptive and may run counter to best-practices in the case where the AIRB bank measures PDs, LGDs, and EADs by using a series of loan-level estimating functions.
- The capital calculation for defaulted assets is confusing (as between the QIS4 requirement and the RG requirement) and may be costly for the best-practice bank to implement. Because the amount of defaulted, but not yet resolved, assets will be a small portion of total assets, we recommend continuation of the current Accord treatment – which assigns a 100% risk weight to the amount of the defaulted asset net of any charge-offs.
- With respect to downturn LEQs, data limitations may preclude estimation for years prior to the current cycle.
- The RG requirement that LEQs be non-negative runs counter to best risk estimation procedures for several product types. Where the empirical evidence is strong, AIRB banks should be permitted to define segments with such negative LEQs.
- The Basel floors on PD (3 b.p.) and LGDs (10% for SFRs) are inappropriate and inconsistent with Basel’s work in moving toward truly risk sensitive capital requirements. U.S. regulators should be ready to move toward the elimination of these floors as soon as they are comfortable with the overall implementation of the new Accord.
- The treatment, for Basel capital purposes, of the PDs and LGDs for certain guaranteed loans, conditional guarantees, and revocable guarantees should be clarified to permit best-practice estimation of PDs and LGDs.
- The requirement that commercial loans of all types should have a PD assigned at the obligor level (rather than the facility level) is inappropriate for certain

property-based loans. Similarly, the requirement that all facilities of an obligor should be treated as defaulted when one of the facilities defaults is inappropriate for certain property-based loans.

- We agree that loans sold at a discount, under certain circumstances, should be treated as defaulted. We discuss an appropriate test for such “in-substance” defaults.

B. Significant implementation issues.

1. Quarterly updating of risk parameters. The RG requires quarterly updating of the “risk parameter estimates” for Basel II (first sentence of paragraph 78 of the RG). This sentence has alternative interpretations and requires clarification. Some may view the sentence as saying that the *explanatory variables* in any PD, LGD, or EAD estimating function must be updated quarterly so as to come up with new PDs, LGDs, and EADs. This would make sense, for example, if a bank assigns PDs, LGDs, and EADs at the loan level or segment-level using estimating equations that estimate these risk parameters as functions of customer or loan characteristics (such as internal behavioral score, balance size, unused line size, LTV, etc.). In such a circumstance, when regulatory capital must be computed quarterly, the input variables to the estimating functions must be updated if the absolute exposures, as well as PDs and LGDs, are to be reported.

A second interpretation of the sentence in paragraph 78 would involve significant compliance costs if the bank uses a segmenting process and estimates PD ratios, LGD ratios, and EAD ratios simply in relation to historical averages for the segment. In such a case, paragraph 78 seems to require the bank to add one quarter’s worth of historical data to the historical database, then recompute the long run average PDs, LGDs, and EADs for the segment, and then apply the appropriate stress to the LGD ratio (and possibly the EAD ratio). Still a third interpretation of paragraph 78 is that, in the case where the bank estimates PDs, LGDs, and EADs via, say, regression analysis, the additional quarterly data must be added to the historical database in order to recompute the *coefficients* of the estimating equations each quarter.

Regulators should be especially aware that at *no* bank are the risk parameter estimation processes totally automated. Updating the historical databases on loan performance each quarter, and then re-estimating, say, the coefficients of a PD estimating function, would be a fairly labor-intensive process. Further, there are also the associated processes of integrating the changed coefficients into the risk management process. Even if the bank estimates PDs, LGDs, and EADs based on historical averages for a particular segment, updating the segment’s risk parameters each quarter would be expensive. Currently, most best-practice banks, for most business lines, do not update PD, LGD, and EAD estimation procedures more frequently than yearly, except when an estimating equation is used and it is the levels of the explanatory variables that are being updated.

Indeed, it is not clear why the RG would require quarterly updating whereas the Wholesale Guidance requires yearly updating. The general objective should be to make sure that the through-the-cycle PDs are appropriate and that DLGDs, and DLEQs, if applicable, are appropriate. Adding one quarter’s loan data to the internal historical database would result in risk parameter estimates that moved up and down each quarter in only very small increments. DLGDs and DLEQs may not be affected at all. The effects on the estimates of required regulatory capital would thus be minor in any one quarter. Moreover, the procedures associated with extracting data, reconciling

discrepancies, cleaning data, and conducting the analysis are time-consuming and, appropriately, require a significant element of judgment. Any requirement that the risk parameter estimation process be done more frequently than, say, yearly would lead inevitably to attempts to mechanize the process, thereby reducing or eliminating judgment as part of the process. At a minimum, for a bank with many dozens of products and sub-products, the cost of frequent risk parameter updates would be enormous, drawing scarce resources away from achieving steady improvement in the risk parameter estimation process itself.

We therefore suggest that a) the sentence in paragraph 78 be clarified to specifically not refer to the updating of coefficients of loan-level or segment-level estimating functions, and b) the frequency of the risk parameter updates, when segmentation is the basis for risk parameter estimates, be treated as a Pillar 2 issue on a bank-by-bank basis, until such time as the U.S. version of the Basel II framework is finalized and internal risk parameter estimation procedures have matured somewhat. Then, if best-practice warrants it, a system-wide yearly update process could be mandated, at least initially.

2. Seasoning requirement. Paragraph 110 of the RG requires that, for segments containing ‘unseasoned loans’ (and for which loan age is a significant determinant of default probability), a bank should assign a higher PD estimate than the through-the-cycle PD -- one that reflects the average annualized *cumulative* default rate over the remaining life of loans in the segment. As you may know, most of the major best-practice banks do not compute annualized cumulative default frequencies for internal purposes, while others do. The strong consensus of our Group is that *requiring* such calculations is not necessary for purposes of the Accord, and may be counterproductive. Nevertheless, annualized cumulative PDs may be useful for internal purposes, and these purposes are discussed in Appendix 1.

We believe the RG requirement is inappropriate for several reasons. First, the Basel II theoretical framework uses a true one-year horizon PD – not an annualized cumulative PD – to reflect practices at the majority of international institutions. Such institutions typically segment their portfolios according to age of loan, because, in many cases, one-year PDs rise with age (that is, obligors have best intentions early in the life of their loan). In the case of mortgages, for example, one-year PDs rise with age, then fall, as principal payments and house price increases act to build up the obligor’s equity in the home. When computing internal Economic Capital for loans in a portfolio whose loans are age-segmented, the bank typically will “move” the unseasoned loans into the higher age brackets as the loans age, thereby assigning higher PDs and correspondingly higher EC to the loans as they age. For mortgages, the internal EC on an individual loan correspondingly rises then falls as the loan ages.

The Retail Guidance requirement that “unseasoned” loans be assigned capital based on a PD (the annualized cumulative PD) that is higher than the true one-year PD is really a form of double-counting. That is, the bank must hold higher than its internal economic capital when the loan is young (and has a low default probability), *and* the bank must hold appropriately high capital when the loan ages (because aged loans under the Retail Guidance must employ true one-year PDs). Note that at the best-practice banks using annualized cumulative PDs, the use of such PDs is consistent throughout the segments. That is, as loans move into the “seasoned” segments, there is a restatement of

the annualized cumulative PD based on the expected life of the new segment, including the effects of prepayment. The bank does not switch between annualized PDs and one-year PDs.

It is also important to note that, depending on the credit product, there may be an “age” effect on PDs only insofar as the risk characteristics of the loans are not fully specified. That is, age of loan may become statistically insignificant in determining default probability when certain other risk characteristics are included in the estimating function. For example, including updated FICO scores (or updated LTV, or “CLTV,” estimates) in the estimating function may cause AGE to drop out as a significant explanatory variable.

It is our understanding that a concern behind the RG’s seasoning requirement is that the recent bulge in new mortgage originations (re-financings), due to low interest rates, results in banks having a current portfolio composition that is younger than in past years. Correspondingly, in future years, as this bulge of refinanced loans ages, the average age of the portfolio will rise and economic capital requirements will rise as well. Regulators are naturally concerned that banks will have enough capital to meet the expected higher capital requirements as the bulge group of loans ages (assuming the new loans are retained by the bank as they age). This is a legitimate concern which we share, but which cannot in any way be addressed by requiring greater current capital for the recently refinanced loans. The issue is essentially a Pillar 2 issue – the bank must show the supervisor that it anticipates the movement of this segment through the age brackets and has planned appropriately to have more capital when the need arises. Alternatively, the bank may plan to sell a portion of the bulge in new loans in order to maintain a desired historical age composition of its portfolio. We believe that proper capital management for *future* capital needs is a supervisory issue, not an issue for the Accord, which is meant to assign capital for the current portfolio (over the chosen one-year future horizon). Indeed, the stress requirements in the RG (paragraphs 165-171) seem to clearly address the issue of how the bank should respond to a “stress” – which in this context could refer to a bulge in new loans. The bank’s demonstration of its ability to respond to the stress can cover a wide variety of available tools – including changes in dividend policy and changes in portfolio composition. That is, the bank must show that it understands the nature of the risks in the recent change in the age profile of its portfolio and will act accordingly (by selling more new loans than usual or by planning to raise capital levels if the new loans are kept).

Indeed, the Retail Guidance’s requirement for increased current capital for the newly refinanced loans – through use of an annualized cumulative PD -- cannot be sufficient to meet the increased capital requirements that would be likely if the bank chooses to hold the bulge amount of new, refinanced loans. This is because the true one-year PD when the loan reaches its peak PD years is, by definition, higher than the annualized PD over the entire life of the loan. We believe that a much more appropriate way to address the issue is to require AIRB banks to formally plan for anticipated and unanticipated changes in the seasoning structure of their portfolios, as part of their determination of overall capital adequacy (i.e., as part of reaching an actual best-practice capital level that is higher than the Basel minimums).

Additionally, requiring the extra capital now for unseasoned loans, when true one-year PDs are low, creates an inappropriate incentive for the bank to hold loans that

are aged (whose Basel-required PDs reflect internal one-year PDs) rather than loans that are new (whose Basel-required PDs are higher than internal one-year PDs). Put another way, the RG requirement takes away from management the ability to choose its optimal age structure for its portfolio by selling new loans as they age and/or keeping loans that are under a particular age. This resource misallocation effect can be seen by noting that, under the RG requirement, the resulting Basel capital requirement for “unseasoned” loans could be significantly above the Basel capital requirement for young but seasoned loans in the next age category.

The seasoning requirement would also lead to some outright inconsistencies. As an example, suppose a borrower refinances a mortgage at a new, lower interest rate. If the borrower’s FICO score has not fallen and the LTV remains the same as before the refinancing, the borrower’s DSCR should improve, implying a decline in PD. Yet, the seasoning proposal would require the bank to raise the borrower’s PD since the refinanced loan is an “unseasoned” loan. Conversely, a cash-out refinancing could easily entail an increase in the CLTV, implying an increase in PD.

It must also be remembered that the asset-value-correlations (“AVCs”) and the chosen confidence interval used for corporate and retail loans in the Basel II framework were carefully formulated to conform to best-practice economic capital models that typically employ true-one-year PDs, not annualized cumulative PDs.² If the U.S. were to require the use of annualized PDs for one segment of loans, this would imply not only a reworking of the estimated AVCs but also application of a lower confidence interval for that segment. These issues are discussed at length in Appendices 1 and 2, which describe the conditions under which some best-practice banks may be utilizing annualized cumulative PDs for certain risk management purposes.

Finally, regulators should be aware that their choice of method for measuring PDs entails a significant cost issue. In particular, the minority of best-practice banks that currently use annualized cumulative PDs (and do so for all segments) would not be burdened by a regulatory requirement for estimating true one-year PDs. That is, such

² It is our understanding that, for home mortgages, the AVCs were derived by first estimating a loss distribution for unseasoned loans, via use of a stylized simulation process, then utilizing annualized cumulative PDs and stressed LGDs to solve backwards for the AVCs (see Callem-Follain, “The Asset-Correlation Parameter in Basel II for Mortgages on Single Family Residences,” FRB, November 2003). This approach to estimating AVCs is consistent with the RG requirement for using annualized PDs. If true-one-year PDs had been used to derive the AVCs (from the estimated loss distribution) the AVCs would have been higher. However, the regulatory analysis begins with the assumption that the estimated loss distribution was “correct” to begin with -- an assertion with which many industry participants disagree. The primary concerns have been that the processes for generating random interest rate changes and random housing price changes when deriving the loss distribution used by regulators were too conservative. Thus, the Basel AVCs, even though generated by a process involving annualized cumulative PDs, are roughly 50% higher than used by the majority of risk practitioners. Also, note that other credit products involve the use of regulatory AVCs which, to our knowledge, were *not* derived using annualized PDs. Finally, it should be noted that there is wide-spread agreement that true one-year PDs for new mortgages are exceedingly low. Therefore the true one-year-horizon EC for such loans is also quite low, at any of several plausible levels for AVCs. For this particular product, therefore, the annualized cumulative PD requirement is really reflective of a more general regulatory concern that Basel capital not be zero or near-zero for any particular segment. This comfort level could be satisfied in far less costly fashion simply by placing a lower bound on the capital level for mortgages in any segment regardless of age (e.g., capital no less than, say, 10 b.p. of exposure).

banks have, in effect, already measured the default frequencies at various horizons, out to the life of the loan. This may not be the case for banks using one-year PDs for internal purposes. For these institutions, there may be a significant cost associated with revising procedures to estimate life-of-the-loan cumulative PDs. Since the U.S. is proposing to apply such annualized cumulative PDs only to the “unseasoned” class of loans, the overall impact on Basel capital for such banks will tend to be minor, while the compliance costs may be large.

3. Definition of default. Paragraph 98 provides specific criteria for a retail definition of default. As it is written, the RG says that default occurs (for IRB purposes) *if any one* of the following conditions hold: a) The days-past-due (“DPD”) reaches the upper bound specified in the FFIEC Uniform Retail Credit Classification guidance; b) a partial or full write-off is taken; or c) the exposure is placed on non-accrual. This language seems to specifically disallow usage of an internal DPD criterion that is less than the FFIEC maximum DPD and less than the point at which write-down or non-accrual status occurs. This language in the RG is in conflict with our understanding of the FFIEC guidance, which simply places an upper bound on the DPD criterion for when charge-offs must take place.³ That is, the FFIEC guidance permits the bank to use, say, a 90 DPD default definition (for purposes of taking a charge-off) , but the RG does not permit a 90 DPD definition of default (for purposes of computing PDs and LGDs), if non-accrual or charge-off occurs *past* 90 days. Rather, the RG seems to say that – to use an example -- if non-accrual or write-down occurs at 120 days, then either of those occurrences must be used as the default definition, not, say, a 90 DPD criterion. Conversely, if the bank places a loan on non-accrual at 90 days, it cannot use a 120 DPD criterion for the definition of default.

At some banks, for some products, the wording of the RG requirement presents a significant challenge. This is because some banks have chosen to define default, for risk measurement purposes, as a certain number of days past due. In some cases, this chosen number of days past due may be greater than or less than the number of DPD at which accounting non-accrual or charge-off takes place (although, in any event, the DPD criterion still would be within the limits set by the FFIEC guidance). Banks may have chosen a particular days-past-due criterion for a variety of reasons:

- To permit a consistent days-past-due treatment (for risk measurement purposes) across all business lines, both commercial and retail (e.g., all loans measured as defaulted at the 90-day past-due mark).
- To permit the historical loss database to generate fewer cases of cures-after-default, thereby providing higher and more statistically significant LGD estimates.

We continue to regard this issue as essentially one of compliance costs – which could be significant -- without correspondingly significant effects on the accuracy of

³ “Actual credit losses on individual retail credits should be recorded when the institution becomes aware of the loss, but in no case should the charge-off exceed the time frames stated in the policy. This policy does not preclude an institution from adopting a more conservative internal policy” (June 12, 2000, revisions to the Uniform Retail Credit Classification and Account Management Policy).

required capital estimates.⁴ If the RG were to require a bank to use a default definition that involves a fewer number of days past due than the bank's current definition, measured PDs would rise. But so would measured "cures" and "prepays." Thus, both current LGD and stressed or downturn LGD ("DLGD") estimates would decline.⁵ Since LGDs enter the Basel ASRF model in linear fashion, and PDs enter in concave fashion, the main effect of the more stringent PD estimate would be a slight *decline* in calculated regulatory capital. The reverse would be true if the RG requirement acted to increase the effective DPD default criterion for the bank. We don't believe that these slight changes in calculated regulatory capital requirements are worth the compliance costs associated with an AIRB bank having to change its internal days-to-default standards used in its internal risk parameter measurement systems.⁶ Rather, we recommend that the bank be permitted to *choose any one* of the following methods for defining default (for risk parameter measurement purposes):

- As the account reaching a certain number of days past due, so long as the number of days does not exceed the maximum number of days-past-due provided for in the FFIEC guidance.
- When the account goes on accounting non-accrual.
- When the bank takes a partial or full charge-off against the credit.

We believe that the differences across banks in the application of these 3 choices will not materially affect calculated regulatory capital charges. Absent such a change in language, the RG would require some banks to change risk measurement practices, possibly at very significant costs, solely for Basel purposes, with little impact on either Economic Capital or Basel capital.⁷

4. Downturn LGD. Paragraph 127 of the Retail Guidance requires that LGD be measured based on 'downturn conditions where necessary'. No definition of 'downturn

⁴ For example, one RMA bank does not place mortgages on non-accrual but rather assesses a charge-off at 180 days past due. For internal risk measurement purposes, however, default is defined as 120 days-past-due. Another RMA bank places mortgages on non-accrual at 90 days-past-due *and* defines default for internal risk measurement purposes also as 90 days past due. Thus, across AIRB banks, many of which use a days-past-due criterion for default (for risk measurement purposes), the days-past-due criterion may vary by only 30 days bank-to-bank.

⁵ DLGDs would decline because a common practice is to measure default-weighted LGDs over the current cycle for which internal data are readily available. A bank may then "stress" its default-weighted LGD by applying a "stress-multiplier" derived from comparing industry-wide loss experience in the "bad" 1990-1991 recession versus the loss experience in the recent "good" recession. Driving down current cycle LGDs via use of a more conservative default definition will also drive down DLGDs. It is also important to note that the "DLGD multiplier" may decline (rise) as current-cycle LGDs rise (decline). That is, there is likely to be less cyclical in LGDs the higher are LGDs. To see this, take the case where the LGD approaches 100%. In such a case, the DLGD multiplier also approaches one. This effect on DLGD multipliers would also serve to limit the impact on measured capital of any change in the DPD definition of default.

⁶ Also, some banks may estimate DLGD multipliers based on aggregate Call Report data over time. Forcing such banks to go to a longer-than-90 DPD standard, would take away the ability to use such Call Report data (in which the longest DPD category of delinquent loans is 90+).

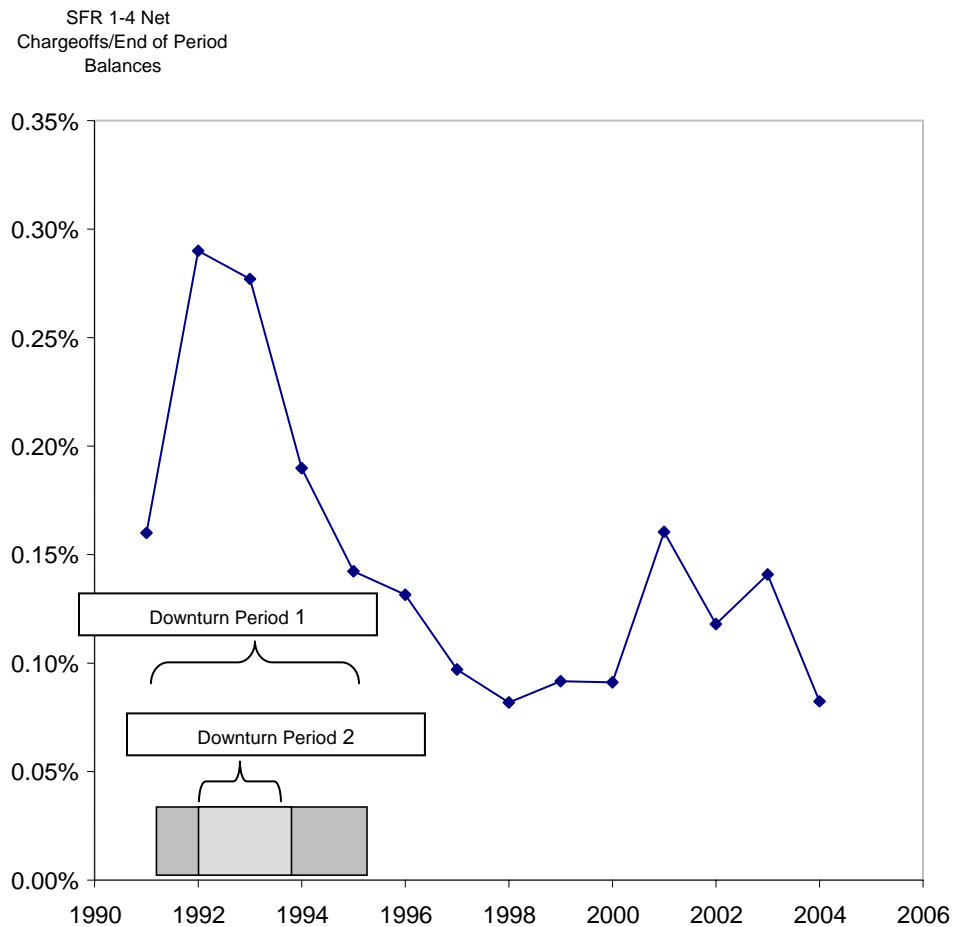
⁷ One Group member points out that the non-accrual definition of default is flawed in that the point at which a troubled credit goes into workout (prior to non-accrual) is more indicative of LGD than non-accrual. Both LGD and EAD might reasonably be predicated on this event rather than on non-accrual. Workout is when the benefits of good collateral become apparent.

condition' is provided, nor is any standard with regard to "necessary" enunciated. Mortgages, however, are explicitly mentioned as a portfolio where LGD may fluctuate with the cycle (so that "downturn" LGD is higher than a default-weighted through-the-cycle LGD average). Because downturn LGDs typically are not estimated as part of internal Economic Capital processes, each of the AIRB banks is now wrestling with exactly how to implement the downturn LGD ("DLGD") requirement. As discussed below, there are several methods for obtaining a DLGD and there will be considerable diversity across banks in the approach taken. We therefore urge supervisors to be flexible on this issue, at least until best practices mature. We discuss below the various problems that may arise in DLGD estimation.

Using mortgages as an example of the overall problem with the DLGD requirement, Graph 1 illustrates that, prior to the recent recession, the last period of distress in retail mortgages was in the early 1990s. However, it is not possible to develop estimates of industry-wide LGDs during any particular period utilizing the Call Report and Thrift Financial Report data available from the FDIC. Therefore, if regulators wish AIRB banks to examine the effects on LGD of a truly long cycle, any institution whose internal mortgage LGD data do not go back as far as the early 1990s presumably must find some external source of LGD data for that period, or use some other method for stressing internally measured LGDs (see discussion below). It is not clear whether actual economic-loss-given-default data are externally available for mortgages.⁸ To the extent such data exist, however, Graph 1 illustrates that the choice of the downturn period is critical.

⁸ One Group member has purchased external data on "cure" and pre-pay rates during the period covered by Graph 1. These data possibly may be coupled with previous research on downturn loss-given-foreclosure ("DLGF") to arrive at a relationship between early 1990s LGD and current-cycle LGD.

Graph 1



[Net Charge-offs as a Percent of End of Period Balances for all FDIC Insured Institutions, 1991-2004.
Notes: 2004 is YTD; 1991 and 1992 are the average of the largest 100 FDIC insured institutions.]

The LGD resulting from the “Downturn Period 1” in Graph 1 would likely be different from the measured LGD in the “Downturn Period 2.” Of course, the ratio shown in the graph represents accounting losses divided by all outstanding balances. That ratio could rise simply because growth in the denominator (balances) falls. Conversely, net charge-offs could be high because default rates are high, not losses-given-default. The matter is complicated even further by imprecision in any attempt to establish the absolute bottom of a housing loan loss cycle (or, put another way, the absolute top of the LGD cycle). Also, the peak of LGDs may not correspond to the peak of default frequencies (since it takes many months for a defaulted loan to work itself through to an “end-state” such as sale-through-foreclosure, or “cure”). In addition, some external LGD data may only be realistically utilized on a year by year basis not a quarter by quarter basis. Thus, it may be difficult to precisely define, for LGDs, the trough *year*, let alone the trough quarter.

For these reasons, we ask regulators to provide great leeway in the manner in which AIRB banks may define the period of time encompassing the DLGD. In particular, when using external observations on stressed LGD rates, banks should be given the ability to choose a time interval as wide as the year on either side of the year in which the analyst believes the trough (peak LGD) has occurred (i.e., a 3-year period encompassing the trough).

Another method for arriving at a DLGD, to continue our example with mortgages, is to simulate the loss-given-default that would occur under an arbitrary choice of a “stress” in housing prices. Models exist that would calculate the loss associated with a defaulted loan if the housing stock suffers a decline in absolute price during the period in which a loan is being worked through foreclosure and REO-sale. Besides the costs associated with developing or leasing such models, there is the problem that, to a significant extent, the choice of a housing price stress is arbitrary. Actual significant absolute price declines have been experienced – such as the California experience in the mid-1990s – but absolute declines across a broader spectrum or for the complete nationwide portfolio of a large mortgage lender have not occurred in the past two recessions.

Moreover, housing price declines would have a much greater impact on losses-given-foreclosure than on losses-given-default. That is, a significant proportion of defaulted loans do not go through to REO sale but rather pre-pay or “cure” (via the homeowner becoming current again with monthly payments). We are aware of no publicly available analyses of long-term averages in prepay+cure rates for mortgages, let alone evidence on cyclicalities in these prepay+cure rates, although some work is currently underway on the subject. Thus, with respect to several of the parametric and structural choices that must be made when using simulation models, there will be a significant degree of subjectivity in the use of such methods.

A third method for estimating a DLGD is to utilize an empirically determined loan-level LGD estimating function that includes macro variables among its explanatory variables. The effects on downturns can then be estimated by choosing a particular level or levels of the macro explanatory variables. Again, data limitations may preclude such functions being estimated with data prior to the current cycle. Thus, we cannot be sure whether there are slope or intercept differences across ranges of the macro explanatory variables that have been observed outside of the current cycle. For this reason, any supervisory requirement to stress LGDs by using levels of macro variables that existed prior to the current cycle could be problematic.

Because of these data and process limitations, there may be instances in which it would be most appropriate to treat the “downturn” as referring to the most recent recession. As internal databases evolve and we gain experience with more cycles, this problem will wither in importance, since, for all practical purposes, AIRB banks will be able to rely exclusively on their internal, loan-level data. It is also the case that some retail product lines do not exhibit cyclicalities in LGDs (e.g., cards), while other lines probably have experienced their most stressed LGDs during the recent recession.⁹

⁹ Aggregate FDIC data for all insured institutions suggest that current cycle LGDs for HELOCs are higher than LGDs in the early 1990s. This result is intuitive, given that net-charge-offs (as a percent of average balances) during the early 2000’s were approximately equal to the experience in the early 1990’s, but defaulted loans (90+ DPD as a percent of balances) were significantly lower during the early 2000’s than

Finally, external data on LGD cyclicalities do exist for other product lines (such as large corporate credits).

Not only are there several reasonable methods for estimating DLGDs, but also the analyst must keep in mind that there is a natural diversification effect associated with cyclicalities in LGDs. That is, the *timing* of peak LGDs will differ across products and across banks. A “bad draw” of the single risk factor in the Basel ASRF model will certainly not cause LGDs in all products and in all portfolios to react in unison. In addition, some products may be affected by different “macro” factors than other products. Also, history suggests that credit quality declines in wholesale lending occur at different times than for retail lending, and the two may even move in opposite directions at points in the cycle. Thus, not only would it be inappropriate for supervisors to set particular years as constituting the “trough” years, but also it would be inappropriate to ignore these diversification effects. We are aware of no studies that empirically estimate these timing differences, although we hope to provide some initial analysis to the U.S. agencies within the coming weeks. At a minimum, until more is known about the timing of any cyclicalities in LGDs, regulators should be both flexible and liberal in their review of individual AIRB bank procedures for estimating DLGDs.

5. Criteria for assigning retail (or “wholesale”) credits to particular Basel AVC categories. In general, the RG criteria for assigning each type of credit to a particular Basel model – QRE, residential mortgages, and other retail – are appropriate. However, we believe that, from a broad theoretical and policy perspective, the bucketing of credit products should reflect the criterion that a particular grouping of credit products (for economic capital purposes) should share a similar range of asset-value-correlations. That is, assuming that the risk parameters (PD, LGD, and EAD) are appropriately estimated, it is the regulatory AVC that determines capital under the Basel process. It is our understanding that regulators are actively considering whether the number of AVC categories should be expanded from the current set of 6 categories:

- Commercial loans and CRE
- SME commercial loans
- HVCRE
- Retail – QRE
- Retail – Residential Mortgages
- Retail – Other retail, including small business managed as retail

Regulators are considering whether to add an IPRE and a HELOC category. In general, from the perspective of precision in risk measurement, the more AVC categories the better. That is, more categories are a step in the direction of permitting AIRB banks to estimate their own AVCs, which, in turn, is a step in the direction of full-internal-models.

The key issue, of course, is the extent to which the particular AVCs chosen by regulators are a good approximation of best-practice AVC estimates. We have commented on this extensively in our past responses. In particular, we have noted that the AVCs for residential mortgages (15%) are on the order of 50% higher than those used

in the early 1990’s. LGDs therefore must have risen substantially since the early 1990’s. The aggregate industry data do not allow us to pinpoint the reason for this rise in LGDs but it is highly likely that there has been a secular rise in the average combined LTV for HELOCs over the past decade. Such a rise is consistent with the double-digit growth rates in HELOCs in the past few years, compared with the early 1990’s.

by the majority of best-practice banks; AVCs for high PD credit card accounts (4%) are on the order of 100% higher than those used by best-practice banks; and AVCs for HELOCs should be significantly lower than the 15% established for first mortgages. We also think that term home equity loans should be assigned similar AVCs to HELOCs, since such term loans generally are for similar purposes, and exhibit similar idiosyncratic default tendencies, as HELOCs.¹⁰

In addition, we wish to note that, even assuming there are no changes to the 6 categories of AVCs, there are several cases in which proper AVC treatment would require changing the criteria used for bucketing the credit product within one of the 6 AVC categories:

a) Small business credit cards. At several of our institutions, business credit cards are issued to small businesses or to individual officers of such businesses. These businesses include proprietorships, partnerships, LLCs, and professional practices. Responsibility for payment can be that of the business or that of the individual, but the accounts are underwritten and managed essentially identically to the retail card portfolios. Under the current criteria, such card accounts must be treated as commercial loans (i.e., as SME business loans), if issued to the small business. However, the default behavior of such accounts is, like retail credit cards, highly idiosyncratic, not systematic, so that the implied AVCs are on the order of those for retail cards. We are planning to assess empirical evidence that may support this view, and we ask U.S. regulators to consider treatment of such accounts as QRE accounts. Indeed, we can generalize to a view that *small business credits exhibit default behavior sufficiently idiosyncratic that these credits should be always apportioned among the “retail” categories according to the nature of collateral (residential collateral versus unsecured) or the bank’s right to cancel a line of credit (credit cards versus other retail), rather than among the wholesale categories.*^{11,12}

b) A revolving line of credit to a small business, using the partner’s residence as collateral. Paragraph 232 of the June 2004 Framework indicates that such lines, if less than €1 million, may be treated as retail credits, but the paragraph provides no further guidance. It may be most appropriate for the AIRB bank to treat the line as a Home Equity Line of Credit (HELOC), if the bank is employing scoring (rating) and management techniques applicable to such lines of credit made directly to an individual.

¹⁰ See RMA, “Industry Practices in Estimating EAD and LGD for Revolving Consumer Credits – Cards and Home Equity Lines of Credit,” March 2004, pp. 3-4, for a list of reasons why HELOCs and HE term loans should receive lower AVCs than SFR first mortgages. Note especially that, with respect to both HELOCs and HEs, second mortgages held by banks tend to be written in cases where the first mortgage is conforming. Not only does this imply greater diversification in the bank portfolio of second mortgages, but also conforming SFRs tend to involve lower-wealth obligors than is the case for non-conforming loans. As we have indicated in prior submissions, industry risk practitioners argue that AVCs decline with wealth, since wealthier borrowers have larger, more diversified asset portfolios whose values are more highly correlated with the macro risk factor. Thus, second mortgages for lower-wealth issuers of conforming first mortgages, should exhibit lower AVCs than the non-conforming SFRs on the books of the AIRB banks.

¹¹ In previous correspondence we have pointed out that credit cards issued to small businesses, with the individual partner signing the obligation jointly and severably, should naturally be treated as retail QREs. The proposal above goes beyond this to the general nature of risk in portfolios of small business credits.

¹² We also seek clarification that revolving lines of credit accessed by check (not just checking account overdraft coverage) also qualify as QRE under the Retail Guidance.

Note further that, at low PD levels, there may be a significant impact on required regulatory capital associated with bucketing the loan into the HELOC category -- especially if Basel later reduces the AVCs for HELOCs below those used for first mortgages.

c) Multi-family lending (“MFL”). We regard any MFL loan in the construction or absorption stage as being on a property not yet “stabilized.” Such MFL loans reasonably should have AVCs that are higher than permanent MFL loans – because the demand for new buildings is probably more affected by macro or regional economic prospects than is the demand for existing buildings (i.e., renters will be more sensitive to general economic prospects when deciding whether to move to new, more expensive space). For this reason, it may be appropriate to assign a higher AVC for construction and development loans (for multi-family use) than the AVC for other CRE loans.

However, once a property under development achieves significant sold-out or rented-out percentages, with a debt-service-coverage ratio (DSCR) greater than 1, the loan should be treated as a permanent loan on a “stabilized” property. Such loans are likely to have very low AVCs relative to the commercial loan category in which the Framework places “low-volatility” CRE loans. That is, the demand for existing multi-family space is likely driven by idiosyncratic events more than systemic events. For example, a particular rental property near a large employer may exhibit a decline in rentals if the employer moves to another location. Such idiosyncratic events or conditions also help determine single-family housing prices in particular locations and, therefore, are drivers of SFR loan performance. Thus, we believe that the true underlying AVCs for permanent MFL loans are much closer to the AVCs for SFRs. Of course, the RMA Group has indicated that the 15% AVC for SFRs is on the order of 50% higher than the AVCs used for internal EC purposes.

Another reason for assigning lower AVCs to MFL loans than to other CRE loans is that MFL loans typically are significantly smaller than the CRE loans collateralized by retail or commercial properties. At one of our member institutions, 80% of MFL loans are less than \$1mm in size and 42% of MFL borrowers are individuals. Small obligors – reflected in small loan size – should have lower AVCs assigned, all else equal. This is reflected in the size adjustment for small and medium size enterprises within the C&I capital requirements, and it is reflected in the generally much lower AVCs for retail products than for wholesale products.

We are probably years away from consensus on estimated AVCs for MFL. In the interim, however, we are highly confident that it would be most appropriate to assign AVCs for permanent MFL loans that are on the order of the AVC for SFRs, or the AVCs for Other Retail, rather than the 12%-24% AVCs associated with ordinary commercial loans.

6. Qualifying Revolving Exposures (“QRE”) volatility requirement. To qualify for the 4% asset-value-correlation (“AVC”) applied to qualifying revolving retail exposures, the AIRB bank must demonstrate that its credit card product exhibits a low loss-volatility over time relative to the long-run average loss rate (paragraph 234(d) of the Framework). The Retail Guidance requests comment on how this requirement may be satisfied.

The requirement is problematic for two reasons. First, the Framework implicitly assumes that volatility in loss rates over time is indicative of the risk inherent in the

current portfolio or the current segment. The underlying assumption is that, on a bucket basis, the true underlying loss distribution is stable over time, so that observations of specific loss rates reflect actual outcomes emanating from a particular cumulative probability distribution. This assumption may be inappropriate for a variety of reasons, any of which could conspire to change the true underlying loss distribution for the segment over time – these reasons could include changes over time in underwriting standards, changes in account management practices, changes in the degree of uniformity of state-by-state personal bankruptcy laws, or secular changes in attitudes toward personal bankruptcy. While these and other factors could contribute to either a widening or narrowing of the tail of the loss distribution over a period of time, we believe that steady improvements in underwriting and account management standards have *reduced* tail-risk in credit card lending, as evidenced by the ability of spreads to have absorbed record personal bankruptcy rates during the recent downturn. We are therefore skeptical of volatility analyses that employ data going back too far in time.

Second, there would need to be a standard of comparison. For example, if a bank computes for credit cards the ratio of the standard deviation of its loss rates (over time) to its historical mean loss rate, to what other credit product(s) should this ratio be compared? The Framework, in paragraph 234(d), implicitly suggests that the comparison standard should be “other retail”. Unfortunately, this category encompasses a wide variety of credit products, including unsecured term loans, auto loans, etc. Moreover, each bank’s “other retail” portfolio will fundamentally differ from other banks’ portfolios – so such a standard of comparison may differ substantially across banks. Perhaps most importantly, comparing volatilities of losses across asset classes should properly take into account differences in PDs.

To see this last point, note that the Basel model can be used to derive an implied level of loss volatility associated with any particular PD, LGD, and AVC. The higher the AVC – for a given PD and LGD – the thicker the tail of the loss distribution and the higher the Coefficient of Variation of losses (defined as the standard deviation of losses divided by the mean, or expected, loss rate). Conversely, the higher the PD, for a given AVC, the *lower* is the implied CoV. In order to see how, for a particular AVC chosen by Basel, varying PD results in a varying CoV, we use a calculator provided to the RMA Capital Working Group by KeyCorp.¹³ This calculator demonstrates that simple comparisons of loss volatility between asset classes – such as comparing the Coefficient of Variation (“CoV”) of losses in Cards to that in SFR or Other Retail – are inappropriate. This is because PD enters the Basel ASRF model in curvilinear fashion – a 10% higher PD, for a given LGD, will result in a less-than-10% increase in capital – and capital is an indication of tail-thickness. Also, a low mean loss rate (denominator of the CoV) tends to drive upward the ratio of the standard deviation to the mean. Thus, low PD assets have higher CoVs, for a given AVC and LGD. The relevant test, therefore, should be to compare the actual CoV of cards with the CoV generated by the risk model (AVC structure) for cards. So long as the actually observed CoV is less than the CoV flowing from the Basel ASRF card model (for the bank’s actual PD and LGD),

¹³ Calculator is courtesy of Michael Pykhtin of KeyCorp. That institution has generously agreed to provide the calculator to regulators and to the RMA Capital Working Group. See the Excel spreadsheet titled KeyCorp-EC-Sigma-Calculator.xls, sent under separate cover (please use “enable macros”).

it is appropriate to place the credit card product in that AVC bucket (or, as we have argued in previous submissions, into an even lower AVC category).

Table 1 below shows the CoVs implied by the Basel Credit Card risk model (AVC of 4%, invariant with PD). Note that for the typical card PD in the range of 4-6%, the Basel model generates CoVs in the range of 40% to 46%. On a nationwide basis, the net charge-off rate for cards (on a year-to-year basis for all FDIC-insured institutions) exhibits a Coefficient of Variation of approximately 21%.¹⁴ This suggests that most or all of the credit card banks' loss rates exhibit less volatility than implied by the Basel card risk model. We conclude that regulators should consider using (as a standard for the QRE test) the volatility of actual loss rates compared with the loss rate volatility emanating from the Basel Asymptotic Single Risk Factor model itself. Moreover, if the suggested QRE test is met, with room to spare, on an aggregate portfolio basis, it should not be necessary to conduct the analysis on a segment by segment basis.

Table 1

Standard Deviation of Loss and Capital

LCI 99.90%
LGD 100%
AVC 4%

PD	EL	St.Dev. of Loss	Capital @ LCI	St. Dev. /Mean
0.08%	0.08%	0.06%	0.40%	75.72%
0.24%	0.24%	0.16%	0.99%	67.49%
0.48%	0.48%	0.30%	1.73%	62.11%
0.96%	0.96%	0.54%	2.97%	56.58%
1.60%	1.60%	0.84%	4.36%	52.37%
2.24%	2.24%	1.11%	5.58%	49.51%
3.20%	3.20%	1.49%	7.19%	46.41%
4.48%	4.48%	1.94%	9.05%	43.38%
6.40%	6.40%	2.56%	11.41%	40.06%
8.84%	8.84%	3.26%	13.89%	36.91%
15.00%	15.00%	4.71%	18.47%	31.42%
30.00%	30.00%	6.97%	23.81%	23.24%

7. Treatment of accrued interest and fees. We are grateful that the U.S. agencies have permitted AIRB banks, at their discretion, to report accrued interest and fees ("i&f") separately from loan balances for purposes of QIS4 (and to assess the capital requirement at the 100% risk-weight level). For purposes of implementing Basel II, the treatment of accrued i&f remains an important issue of compliance costs versus accuracy in risk measurement. We agree that, from a theoretical perspective, accrued i&f should be

¹⁴ This is for the years 1993 through the first half 2004, for the ratio of NCOs to average balances.

included in the EAD. However, practical problems arise. As we have noted in our previous correspondence, there are diverse accounting practices and, as well, differing treatments of i&f within management information systems:

- For some products (or banks), accounting practice may be to carry accrued interest and fees within “other assets.” For some products (or banks), the accrued interest may exist in the general ledger as an “other asset” only insofar as the interest is accrued but not invoiced.
- For some products (or banks), the accrued interest and fees receivable may continue to reside within “other assets” after invoicing, if the interest and fees are unpaid. For other products (or banks), especially for credit cards, unpaid interest and fees may be capitalized within the loan principal amount.

For internal risk measurement purposes, as opposed to accounting purposes, the measurement of EADs and LGDs for retail products also varies across banks:

- a. Some banks include any unpaid i&f at the time of default within the EAD and may measure LGDs (as required in paragraphs 122 and 126 of the RG) by discounting recoveries and recovery costs back to the time of default (and may do so by applying a higher-than-coupon discount rate to the recoveries and expenses). Other banks include the accrued i&f in the exposure but do not discount recoveries, or discount them at the loan coupon rate.
- b. Some banks do *not* include unpaid i&f within the exposure at default, but subtract the unpaid i&f from recoveries (thereby generating lower EADs but higher LGDs than banks using (a) above).
- c. Still other banks may ignore unpaid i&f both with respect to EADs and LGDs.

We believe that either method a or b above would be appropriate, assuming proper discounting of flows. However, it is the case that, except possibly for an institution in extremis, accrued interest and fees represent a very small part of exposures.¹⁵ Therefore, we ask U.S. regulators to consider permitting affected banks to continue reporting, for Basel purposes, accrued i&f as separate accounts with a 100% risk-weight attribution. The resulting Basel capital requirement would be highly conservative in almost all instances.¹⁶

8. Segmentation issues. The RG language with regard to segmentation, starting at Paragraph 30, raises several issues that may affect implementation costs as well as the differences between best-practice Economic Capital measurement and Basel II capital requirements. In particular, the RG states that segmentation must be based on risk characteristics. These characteristics include credit scores, delinquency status, loan-to-value ratios, etc. The RG language in Paragraph 31 seems to preclude the use of

¹⁵ Note that some institutions do not break out accrued i&f from Other Assets within their annual reports. For others, the accrued interest receivable is on the order of one-half of 1 percent of Total Assets. Thus, required regulatory capital may not be materially affected either way -- whether i&f is included as part of estimated exposures and LGDs, or whether i&f simply continues to attract an 8% capital charge.

¹⁶ One of the RMA credit card banks also points out that a reserve for anticipated losses from accrued but unpaid i&f may be set up as a contra-asset against loan balances in a manner identical to ALLL treatment. To the extent that EL is calculated on all legally-owed amounts (both principal and accrued but unpaid i&f), it would be appropriate to combine this i&f reserve with the ALLL to derive a comprehensive measure of EL coverage in the ALLL-EL calculation (for capital adequacy purposes only).

segments defined by PD-LGD ranges, in which loans are bucketed into any particular PD-LGD cell based on loan-level estimates of PD and LGD.

Currently, only a few of the RMA banks use, for internal EC purposes, empirically-determined PD, LGD, and EAD estimating functions at the loan level.¹⁷ More typically, segments are defined in terms of ranges of FICO scores, ranges of LTVs, etc., and then all loans within each FICO/LTV cell are assigned the same PD, the same LGD, and the same EC per unit of EAD. At the banks using loan-level equations, however, EC may be estimated at the loan level rather than at the segment level. At such institutions, risk-characteristic-segments may still be used for other management purposes, such as computing various traditional management metrics such as loss rates and profit rates for various buckets of homogeneous clients.

The RG language does not preclude the bank from using its loan-level estimates of PD¹⁸ and LGD to arrive at an average balance-weighted PD and LGD within a risk-characteristic-segment. The problem, rather, is that the RG requires that validation and back-testing procedures must be conducted *at the segment level*, apparently in addition to the validation and back-testing that naturally must be done for loan-level equations. For example:

- Paragraph 39 states that banks must provide a rationale for the ranges used in segments.
- RS-6 states that a bank must review its segmentation system annually and have clear policies for modifying the system.
- RS-8 states that banks must validate that their segmentation process provides reliable “long-run estimates of the IRB risk parameters” – apparently even though it is the loan-level equation that generates the estimates and, in any case, the long-run LGD is not used in the Basel process.
- RS-10 states that banks must establish internal tolerance limits for differences between expected and realized outcomes that require appropriate managerial review.

We raise these issues because we believe that best-practices are evolving toward the use of loan-level risk parameter estimating functions. At the same time, we understand that, if a bank currently estimates PDs and LGDs, say, by measuring the historical means for these parameters for each particular segment, then there should be a burden to show that the segmentation process makes sense. The Basel capital process, however, should be divorced from the much broader process of risk management and, in particular, banks should not have to bear the costs of documenting, validating, updating, and back-testing its *segmentation* system, if that system is used neither for Basel purposes or internal EC purposes. Indeed, when segments are not used for PD and LGD estimation, we can see no reason why segments can’t be defined fairly loosely (so long as the appropriate risk characteristics are used), or with regard to business or product divisions. There should be nothing wrong with simply dividing the FICO scale into 10 equal segments or having LTVs divided up into 20 percentage point ranges, etc.

¹⁷ See, for example, “Industry Practices in Estimating EAD and LGD for Revolving Consumer Credits – Cards and Home Equity Lines of Credit,” RMA, March 2004.

¹⁸ See issue 14 c), below.

It is also useful to point out that regulators are likely to develop a Basel capital reporting system that will require banks to lump exposures into PD-LGD cells, much as is being done with the QIS4 exercise – because it would be extremely costly and difficult to require all banks to report their exposures within a common risk-characteristic-segmentation system (there currently being as many risk-characteristic-segmenting systems as there are banks). What is critical, from both the regulators’ and the banks’ perspectives, is that the balance-weighted risk parameters that are reported in each PD-LGD cell are as accurate as possible. Loan-level estimation procedures provide the greatest amount of granularity and, other things equal, potentially the greatest accuracy. Therefore, we request clarification that the language in the RG dealing with justification, validation, back-testing, and ongoing monitoring of *segments* is not applicable when loan-level risk-parameter estimating functions are used to arrive at balance-weighted risk parameters for segments.

9. Calculations for defaulted assets – BEEL and PLGD. Paragraph 128 of the RG requires that once an asset defaults, a bank “must construct its best estimate of expected losses (BEEL) *based on current economic circumstances* and risk characteristics”. The downturn LGD minus the BEEL is then the capital required on the defaulted asset. There are several possible interpretations of BEEL:

- a. Because the asset is already in default, one interpretation is that BEEL is essentially a point-in-time LGD measure (based on the ‘current economic circumstances’ wording of the Retail Guidance). However, in the majority of AIRB banks’ retail portfolios, for internal purposes, no such point-in-time LGD measure that reflects instrument level characteristics as well as economic circumstances is available. For these institutions, it is not clear how this measure would be produced without a *significant* amount of infrastructure development and process rebuilding.
- b. BEEL could represent a through-the-cycle loss given default for defaulted assets of a given risk profile. This interpretation would still allow for a non-zero capital charge on defaulted assets equal to the difference between downturn LGD and TTC LGD. This would not require significant additional infrastructure or process rebuilding for many banks. However, the resulting capital would be significantly overstated in the case where the asset defaults during other parts of the cycle besides recession.
- c. BEEL could be the accounting charge-off for the defaulted asset at the point where accounting practice requires a charge-off. Such a charge-off could be higher or lower than an estimate of true economic loss. Moreover, charge-offs could be taken at a different DPD criterion than the DPD criterion used in measuring PDs and LGDs.

There is also the issue of whether regulatory capital for defaulted assets should consist of the difference between downturn LGD and BEEL (as in the RG) or the difference between “potential” LGD (or PLGD) and BEEL (as in the instructions for QIS4). If the latter, then it would be helpful to reach a consensus on how to define PLGD. One possibility is to measure variation in observed LGDs on defaulted assets during each part of the cycle. PLGD could then be defined as the point-in-time LGD plus x standard deviations of observed LGDs (for a bucket) during each of several quarters

surrounding the current part of the cycle. As is the case with downturn LGDs, data limitations likely would preclude making these calculations for historical periods earlier than the current cycle.

While the majority of the RMA Capital Working Group members agree with the notion of assigning capital to defaulted assets, we believe the issues raised above will lead to greater inconsistency across AIRB banks than is necessary or desirable in this particular instance. Under any of several analytical regimes, the effect on overall bank capital is likely to be small so long as defaulted assets (assets that have defaulted but not yet been fully resolved) are small. Thus, we think it would be appropriate to simply continue the treatment of defaulted assets as exists under the current Accord. That is, defaulted assets would receive a risk-weight of 100% against their current carrying value net of any partial charge-offs.

10. Downturn LEQs. Paragraph 146 of the RG requires a downturn stress be applied to the loan equivalency ratio for retail products involving unused lines of credit (such as HELOCs or cards). The key issue here is similar to the issue of downturn LGDs. AIRB banks may not possess internal data on draw-downs prior to the current cycle. At the same time, we are not aware of any industry data on line usage at default. Thus, for all practical purposes, the only LEQ estimates we can construct would be based on internal current-cycle data. With respect to HELOCs, industry aggregate data appear to show that HELOC LGDs have been higher in the current cycle than in the early 1990's recession, while default rates have been roughly the same between the two periods.¹⁹ In other words, it is reasonable to conclude that the current cycle represents the "stressed" period for HELOCs. Therefore, we believe public policy would be best served by permitting use of internal current-cycle data to establish the Basel LEQ (as well as the Basel LGD) for HELOCs. Finally, we note that logic suggests there is no significant cyclicalities in the LEQs associated with credit card accounts. This is primarily because management may unilaterally reduce unused lines when spending patterns and/or behavioral scores suggest it would be prudent to do so, or when general stress economic conditions exist. Indeed, changes in account management practices over time are likely to be more important in determining LEQs (EADs) than are changes in macro conditions.

11. Non-negative LEQs for unused lines. Paragraph 148 of the RB states that loan-equivalent-exposure ("LEQ") for unused lines may not be negative. That is, the Framework places a floor on exposure-at-default ("EAD") equal to current outstanding balances. This floor may be inappropriate for certain types of loans. First, amortizing loans near the end of their term have monthly payments that may consist mostly of principal repayments. Therefore, any default over the one-year horizon may likely involve unpaid principal and interest that are lower than at the start of the period. For some retail lines of credit, historical data may show that, for some segments, borrowers actually pay down outstanding balances prior to default (in an effort to preserve credit standing).

Still another case in which AIRB banks possess data showing EADs less than current balance are some forms of asset-based lending. Such lending is often to a very high PD client in which, without the asset-based structure, the loan would be non-performing at inception. For inventory-based lending, a typical line may extend to, say,

¹⁹ See footnote 9 above.

65% of inventory; for receivables-based lending, up to, say, 75% of receivables. Typically, the bank has complete discretion on the LTV – that is, the bank uses line management *and* collateral management as methods for controlling credit risk. At one Group member, internal data show that there is an average of a 20% reduction in outstanding balances at default from any time prior to default for asset-based lending.

If Basel does not recognize that LEQ is negative, then there will be disincentive to do such lending.²⁰ If regulators do not wish to change the requirement on LEQs, then it would be possible to adjust downwards the LGD (rather than have EAD less than current outstandings). That is, it would be consistent to measure the LGD as the ratio of economic losses divided by the EAD with the non-negative LEQ in place. But this is a second best solution since the EAD issue is separate from the PD-LGD issue (i.e., even if we get the EAD-LGD trade-off right, we may not get the PD-LGD trade-off right, which also affects capital calculations).

If internal data support EADs less than 100% of current balances, the Basel II treatment should be accommodating for the particular bucket involved – that is, this issue should be essentially a Pillar 2 matter. Also, it is possible to treat this issue as mainly one of interpretation. The EAD floor, if applied at the broad product level (e.g., all commercial loans or all mortgages), would be much less of an issue than if applied at the segment level.

12. Floors on PD and LGD. As we have indicated in earlier submissions, we continue to believe that best-possible risk measurement requires strict adherence to the actual PDs and LGDs estimated using best-practice techniques. Thus, the Basel II floor on PD (3 basis points) and the Basel II floor on LGDs for SFR mortgages (10%) are simply inappropriate in the context of regulators' good-faith efforts to reform capital regulations. These floors will lead to capital resource misallocations or, at best, added costs associated with attempts to arbitrage the resulting inappropriate regulatory capital requirements. As regulators become more comfortable with truly economic estimates of required capital, we ask that they be open to removing these arbitrary floors in the future.

13. The estimation of PDs and LGDs for asset-based commercial loans, certain commercial real estate loans, and guaranteed commercial loans. The June 2004 Framework contains several provisions that, depending on how U.S. regulators rewrite the Wholesale Guidance, could prove problematic and, possibly, counterproductive to best risk measurement:

- a. Guaranteed loans: The bank must assign an obligor rating to the borrower as well as to the guarantor at the outset of the credit and on a continuing basis (Paragraph 481 of the Framework). In the case of a 100% guarantee, the regulatory capital calculation would not involve using the PD of the obligor, unless Basel at some future date permitted some recognition of the double-default effect of guarantees (i.e., absent change, the PD of the guarantor would substitute for the PD of the obligor). We support an appropriate recognition of the double-default benefit of guarantees. We also wish to point out that, in some cases it is not practical for the bank to

²⁰ Also note that some forms of asset-based lending can continue to perform when the other liabilities of the obligor are in default (see discussion below on assigning PDs). Therefore, two inappropriate disincentives may be working against asset-based lending – the requirement that LEQs may not be negative, and the requirement that PDs be assigned at the obligor level rather than at the facility level.

assign a rating (or PD) to the obligor (e.g., when the obligor is an individual) when there is a 100% or near-100% guarantee (e.g., for guaranteed student loans). Clearly, when the guarantee is significantly less than 100%, there is a need to assign a PD to the un-guaranteed portion of the credit. However, we are concerned that the requirement of Paragraph 481, if applied without exception to all guarantees, would lead AIRB banks to develop scoring/rating procedures for some obligors for which the score/rating would have no regulatory capital or internal economic capital use. We seek confirmation that the general spirit of Paragraph 481 will be implemented as a guiding principle rather than as an inflexible prescription. As a practical matter, this also means that, should regulators institute some form of double-default provision, banks should be permitted to make a business decision *not* to take advantage of the double-default provision (by *not* measuring both the PD of the guarantor and the PD of the obligor) where it is impractical to measure the PD of the obligor.

- b. Guaranteed loans: Irrevocability. Paragraphs 140 and 484 of the Framework indicate that guarantees cannot be cancelable by the guarantor. Some guarantees, however, provide for the guarantor to cancel with 60 days notice. Such clauses typically are coupled with clauses permitting the lender to call the loan upon receipt of notice to cancel the guarantee. In such a circumstance, if the obligor should default upon notice of call, the guarantee would still be in effect and would be exercised. We seek clarification that, when these two types of clauses exist together in a financial guarantee, paragraphs 140 and 484 would not cause the guarantee to be rejected as an eligible risk mitigant.
- c. Conditional guarantees. Under the Standardized approach, Paragraph 190 of the Framework indicates that: “The bank must have the right to receive any such payments from the guarantor without first having to take legal actions in order to pursue the counterparty for payment.” Under the AIRB approach no such language exists and, further, Paragraph 484 states that clauses specifying “conditions under which the guarantor may not be obliged to perform (conditional guarantees) may be recognized...” In this context, certain guarantees, such as SBA guarantees, may require lenders to first seek satisfaction from the obligor before the guarantee can be fully realized. Note also that SBA guarantees cover most, but not all, of the amount outstanding. We seek clarification that, at least in the context of AIRB banks, such guarantees will be recognized for risk mitigation purposes.
- d. Guaranteed loans: The effects of a financial guarantee may be shown either in PD or LGD, but not both. This requirement of the Framework (Paragraph 480) is at odds with historical data that may clearly show that the guarantee reduces both the PD and the LGD for some credit products. That is, it is in the interest of the guarantor to work with the obligor to forestall default, and the existence of such implicit support shows up in the default frequency data with regard to guaranteed versus non-

guaranteed loans. If a bank already reflects the guarantee in both the PD estimate and the LGD estimate for internal EC purposes, it would be burdensome to institute a second Basel-only process because of the manner in which the Framework is worded.²¹

- e. Commercial loans of all types must have a PD-rating assigned at the obligor level, not the facility level. This requirement (within the Wholesale Guidance at page 15) states that separate facilities of the same obligor must be assigned the same obligor grade (and, by implication, the same PD) as other facilities to that obligor. This requirement is at economic odds with several forms of asset-based lending, including certain income-producing commercial real estate loans. An asset-based loan can continue to perform when the other liabilities of the obligor are in default. Some such loans receive debtor-in-possession treatment in bankruptcy (in which the treatment is executed through agreements with other lenders); others are actually originated as DIP financing. It would thus be *less* risk-sensitive if Basel required banks to grade such loans (set PDs for the specific facility) as if the loan is to be repaid through the general cash-flows of the obligor.

More broadly, a distinguishing feature of many CRE loans is that they are underwritten largely with respect to the economic qualities of the facilities – i.e., with respect to the income producing potential of the specific underlying real estate. Even when “guarantees” exist that run to the obligor, in practice the loan is originated or declined based primarily on the prospects and characteristics of the property. Further, in some states (such as California), commercial real estate loans are subject to “non-judicial” rules that effectively require the lender, in the event of non-payment, to go after either the property or the obligor, but not both. In practice, recoveries are more certain and higher if the lender goes after the property. Thus, from an economic perspective, the assigned “rating” of the transaction pertains to the *facility*, not the obligor – and the PD estimated for input into either the regulatory capital model or the bank’s internal economic capital model should be determined primarily by facility characteristics.

- f. For commercial loans, when a single facility of an obligor defaults, *all* facilities of that obligor are deemed to be in default. This portion of the WG (page 15) is consistent with the notion that PDs should be applied at the obligor level – but it is at odds with both the economics of some transactions and the actual language of contracts which often act specifically to attach “default status” solely to the transaction. As noted above, this is especially important to banks operating in “one-action”

²¹ Note that secondary sources of repayment (“SSRs”) exist even in the absence of a legal guarantee. For example, when lending to a subsidiary, the parent does not have a legal obligation to bail out the sub, but often does so. Internal data show that PDs for such subs are definitely lower than for un-guaranteed loans to unaffiliated companies of similar risk characteristics -- so the implicit guarantee affects the PD. Then too, recoveries are greater for any guarantee (double recovery), including non-binding guarantees.

states – in which the choice is almost always made to pursue the collateral rather than the obligor. A telling statistic for one of the Group members is that, in MFL, 80% of obligors that had 2 or more facilities, and defaulted on one of those facilities, did not default on any other facility.

14. Loans sold at discounts; loans sold or securitized. Paragraph 452 of the Framework states that exposures should be treated as in default, for purposes of estimating default frequencies, if the bank “considers that the obligor is unlikely to pay”. Paragraph 453 says an indicator of “unlikely to pay” includes the case where “the bank sells the credit obligation at a material credit-related economic loss.” U.S. supervisors have said that this is a very important issue to them, in that they wish to make sure that when we estimate PDs, LGDs, and EADs, we are using historical internal data that reflect material credit-related losses on sale. Going beyond this concern, U.S. regulators have included in the RG a much broader requirement that: “Quantification of the IRB risk parameters must be adjusted appropriately to recognize the risk characteristics of exposures that were removed from reference data sets through loan sales or securitizations.” (RS-27). Thus, in the RG, the sale of loans not at a discount is also important.

First, there is the question of whether loans sold at a discount should always be considered to be “defaults” for purposes of PD estimation. In reality, performing commercial loans are often sold or bought in order to fine-tune the desired risk characteristics of the commercial portfolio. Usually, good loans are sold at something of a discount from par, even if the loan is highly-rated and has not been downgraded. Recent data show, for example, that investment grade loans are generally sold at discounts below 5%. Even single-B loan sales exhibit a mean bid-ask price of 95% (but with a substantial standard deviation). Also, these loans often recover in the months after sale (although they often experience further declines in value before the recovery).

More to the point, the Basel credit risk model is not a mark-to-market model but rather a default-mode model. Asset-value-correlations and the maturity adjustment for commercial loans have been structured to take account of the default-mode nature of the Basel model. Therefore, a requirement that *any* loan sale at a discount be treated as a “default” is too severe. Conceptually, if one is to take account of all value declines on sold assets, one should also take account of value increases as well as value declines, and on held assets as well as sold assets (i.e., view credit risk within a mark-to-market framework). At the same time, we recognize that loans sold at a severe discount can, to some extent, represent effective defaults (in that the super discount is reflective of the loan’s PD having risen close to 100%). As a general rule, we would prefer that the standard be left up to the individual bank. If U.S. supervisors, however, wish there to be a “bright line” we suggest that “default” status attach itself to unsecured commercial loans sold at a CCC or lower rating (at the time of sale) and for which the sale discount is 30% or more. This treatment is more conservative than the mean 41% discount on traded “D” loans and represents something higher than the mean discount of 20% on traded *non-defaulted* CCC loans. Additionally, one could adjust the defining discount to reflect the remaining maturity of the loans (that is, the defining discount could be lower for shorter-tenor loans and vice versa for loans with longer tenor).

There also is the question of how, if at all, banks take into account their asset sales when measuring Basel risk parameters. For example, one could estimate PDs

without taking into account asset sale discounts, then go back and measure losses on non-defaulted asset sales separately. The ratio of total losses (on held defaulted assets and on sold discounted assets) to losses on held defaulted assets could then be used to gross up the previously estimated PD. This approach might provide a reasonable approximation to the approach in which discounted loan sales and held defaulted loans are lumped together within the reference data set. Thus, we believe that U.S. supervisors should be flexible in permitting a diversity of approaches, allowing several practices to evolve over time as truly best-practices.

Second, the RG requirement that ordinary loan sales and loan securitizations must be accounted for to protect against bias in the risk parameter estimates is problematic. We understand the need to maintain reference databases that are as full and useful as possible. Simply in order to make the best PD, LGD, and EAD estimates, a bank would want to maintain databases, where possible, of the performance characteristics of sold loans (post-sale). However, when the bank or an affiliate is not the servicer of the sold or securitized loan, this may not be possible. Nothing in the RG should be interpreted to mean that banks should alter their relationships with special purpose vehicles or correspondents if such relationships do not currently call for the selling bank to service the sold loans. Also, we agree with the RG's reminder that, for loans currently held on the books, the fact that the bank is likely to, or plans to, sell any particular type of loan in the future should not alter the loan's *current* estimated PD, LGD, and EAD. Thus, to the extent possible, the Basel risk parameters should be based on historical performance of loans in that segment, including loans of a particular set of risk characteristics that may have later been sold.

15. Other issues.

a. Clarification of materiality standards. Paragraph 9 indicates that there are two standards for materiality: 1) the exposures must be "small as a percentage of the bank's total retail exposures, and 2) the nonmaterial retail portfolios must be a small percent of the bank's total amount of retail exposure credit risk. We think that it is not necessary to have both of these requirements. The real issue is that, by applying Basel I standards to the nonmaterial portfolio(s), the resulting total capital requirement will not be significantly different from the total capital required if the nonmaterial portfolio were assessed capital via best-practice methods. Thus, only the second of the two RG standards is needed. Note also that, generally, retail lending involves EC below the old 8% standard. Therefore, one could assess capital against the portfolio in question at the 8% standard, then define materiality as the case in which the resulting "old Accord" capital for the portfolio is equal to or greater than, say, 5% of Basel II capital for the rest of the retail portfolio.

b. Clarification on private banking loans. Some banks make unsecured loans to individuals as part of their private banking practice, in which the individual loans are rated and managed on a loan-by-loan basis. That is, the loans are not treated as homogeneous pools of retail loans. The RG is clear in that such loans do not qualify as retail loans (paragraph 14 of the RG) and must be treated as corporate loans. However, a question is whether such loans are subject to the SME vs. large corporate distinction within commercial lending. Typically, such loans are made to individuals whose net worth and cash flows are tied to their professional practices or small-to-medium businesses. Thus, arguably, the appropriate asset-value-correlations should be lower than

for large corporate loans for which default is more systematic (less idiosyncratic) than for loans to smaller firms. We seek clarification on this issue.

c. Clarification on PD estimation. As in the case of estimating DLGDs, we seek clarification that, for retail products, it is permissible to estimate PDs via any of the three major ways in which best-practice banks currently estimate PDs: a) using a loan-level PD estimating function (e.g., a logistic regression utilizing important risk characteristics of the obligor and/or facility), b) using a so-called EL approach, by measuring dollar loss rates for a segment then dividing these loss rates by estimated LGDs; c) using a simple count, segment-by-segment, of the number of loans that default by the end of the period, divided by the number of accounts outstanding at the beginning of the period. This clarification is needed because the RG (Paragraph 101) appears to require that PDs be measured only by method c) above. Note that this one-way-only requirement does not exist for estimating LGDs or EADs. Also note that methods b) and c) approach one another if account size (if statistically significant) is one of the variables defining segments. Finally, all three methods approach one another as the segmenting process becomes finer and finer (relies on greater numbers of, and greater ranges of, explanatory risk characteristics). We therefore see no compelling reason for regulators, at this point in the evolution of best practices, to require one method over the others.

d. Compliance costs for measuring SME size and group aggregate loan size.

1. To take advantage of the appropriately lower AVCs for small and medium business enterprises within commercial lending, AIRB banks must measure business size, continuously across all sizes, for SMEs. It would be far less costly to set a cutoff size at origination (and have the AVC involve a step function).
2. For small business loans treated as “other retail,” the AIRB bank must limit total exposure to a single borrower at \$1 million, on a fully consolidated basis (Paragraph 13). Again, it would be costly to enforce this rule. Also, as in the case of the SME rule, arbitrage is possible. Therefore we suggest that both of these hard-wired rules be replaced by a supervisory process that looks at the inherent economics of the portfolio(s). That is, the bank would qualify for using the SME or small-business-as-retail AVCs if the bank can demonstrate that risk characteristics of the loans, and management procedures for the loans, are consistent with significantly more idiosyncratic default behavior than is the case for ordinary commercial loans. Note also that, if either of the two cut-off standards is retained, there should be some sort of indexing for inflation over time.

16. ISDA responses. The RMA Capital Working Group supports the views and formal response(s) of ISDA with respect to credit risk mitigation (including double-default/double-recovery effects of guarantees), trading book versus banking book issues, and securitizations (including synthetic securitizations).

Appendix 1

Issues Pertaining to Age-Related Capital Treatment: The use of annualized cumulative PDs

Some banks have looked critically at how to appropriately measure EC and RAROCs, and how to set prices appropriately when a class of loans exhibits seasoning-related default characteristics. If one-year PDs rise with account age (and even if PDs fall after rising), it would be inappropriate to make loan underwriting and pricing decisions based on the one-year PD of the loan at inception. If the loan is made on the basis of the first-year PD, and PD is expected to rise thereafter, the resulting “seasoned” RAROC may fall below required rates of return.²² At the same time, if the bank determines its overall level of capital adequacy based on the loan’s one-year PD at inception, it may have to raise additional capital to meet any particular soundness standard when the seasoned PD rises. Or, put another way, rather than have PDs (and capital requirements) rise and then fall over time, the bank may reasonably prefer to use an annualized PD over the life of the loan.

To handle these issues, some banks have routinely measured PDs (for use within their internal EC models) as the annualized cumulative default rate over the expected life (or, better, the expected duration) of the loan. For example, if a loan has a 5 year expected life, the bank would measure the 5-year default frequency and employ the time formula to arrive at an annualized PD for use in its credit risk models.²³ When this is done, however, it is important to be consistent with regard to a) the choice of a confidence interval to apply to the risk model, and b) the estimation of asset-value-correlations used within the risk model (if the internal risk model is constructed in similar fashion to the Basel ASRF model).

Confidence intervals. All of EC theory is based on a desired, targeted insolvency probability for the bank. This insolvency probability, in turn, is usually based on a targeted bond rating for the bank’s debt. If the bank wishes to maintain, say, a AA rating, and if it chooses to measure the risk of its portfolio over a one-year horizon, the bank may use the observed historical one-year default rate for AA securities. Table A-1 below shows this default frequency to be about 2 basis points – so the bank may choose a 99.98 percent confidence interval for its internal EC measurements. But, if the bank chooses to measure default frequencies of its loans on an annualized basis over the life of the loans, it should also use a targeted insolvency standard that is representative of the annualized cumulative default frequency of AA-rated bonds over the same expected life. Table A-1 shows that, for a 5-year life, the annualized cumulative default frequency for a double-A instrument is approximately 5 basis points, not 2 basis points. If the bank uses annualized default frequencies for its loans, but then measures EC as the loss rate on the cumulative loss distribution at the 99.98 confidence interval, it is effectively choosing a

²² The discussion here is carried out in the context of a default-model credit risk model. Best-practice is to measure EC (and RAROCs) using a mark-to-market mode credit risk model in which EC will depend on the remaining maturity of the loan and the credit-risk-adjusted term structure.

²³ $PD_1 = 1 - [1 - PD_T]^{(1/T)}$ where T is the number of years over which the cumulative default frequency is measured.

more stringent insolvency standard than AA (it is imposing a more stringent stress test on its internal EC measurement).

Some researchers have handled the seasoning issue by first determining the expected duration of the asset, then using a time horizon (for EC purposes) equal to that horizon. A different horizon may be used for each asset class (corresponding to the expected duration of the asset class). Under this method, PDs are measured using the long horizon and *without annualizing* the PD -- and the confidence interval is determined using the same long horizon for the desired corporate bond rating. As shown in Table A-1, when a 5-year horizon is chosen along with a desired AA bond rating, the confidence interval should be approximately 99.76 percent ($100-0.24$), not 99.98 percent.

It is also the case that banks may appropriately use a different method for estimating capital for capital adequacy purposes (and portfolio capital allocation purposes) than the method used for pricing purposes. That is, one could look at PDs over the life of the loan for pricing purposes (with the appropriate caveats), while using a true one-year horizon when measuring capital adequacy. Additionally, the bank could apply stress tests (for purposes of measuring capital adequacy) that involved using higher than true one-year PDs (or, alternatively, higher confidence intervals than implied by the targeted bank bond rating). It is in this latter context that use of annualized cumulative PDs serves as a way to transform a life-of-the-loan horizon into what amounts to an “annualized” equivalent of the loss distribution associated with the life-of-the-loan horizon. If a bank were to use such a test for capital adequacy stress purposes (by estimating the “annualized” loss distribution but applying a confidence interval associated with a true one-year horizon for the targeted bond rating) it should do so for all segments of loans, not just new loans. Indeed, the Retail Guidance requirement for using annualized PDs for *only* the new loan category is inappropriate, even if a modified confidence interval were to be used.

From a consistency standpoint, Basel should choose between using, on the one hand, an annualized cumulative PD for all age segments (for a given set of non-age risk characteristics) or, on the other hand, a true one-year PD so long as the bank properly buckets by age where there is a documented age-PD relationship. However, changing to an annualized cumulative PD approach now, so late into the Basel II process, is simply not practical, especially since many banks take age into account when estimating PD. Moreover, the annualized cumulative PD approach applied to *just* the un-aged segment is unfair in that, as that cohort becomes aged, the bank must apply a true-one-year PD to the cohort at the peak of the age-PD curve. In other words, the bank must apply higher-than-needed capital for the new loans when they are new *and* must apply exactly correct capital for the new loans after they have aged. This is why, for internal EC practices, banks that do use an annualized cumulative PD tend to do so for *all* age cohorts over the expected life of the loan.

Asset-value correlations. Another issue that arises when taking seasonality of PDs into account is the method by which the bank estimates AVCs (in the context of an ASRF model). A simple method for estimating AVCs is to assume that observed losses over time in a sub-portfolio are reflections of a true underlying loss distribution (i.e., the true AVCs are stable over the number of quarters covered by the observed-loss database). The researcher then “backs into” the implied AVCs using the methodology (sometimes termed a “mean-variance” approach) described by Pykhtin (see Appendix 2). Another

implicit assumption in this approach is that variance in the observed (time-series) default rates is mainly due to variance in the systemic risk factor (e.g., state of the economy). However, if account age is important in determining default probability, and the time-series in question has not been properly *bucketed by account age*, some of the observed variance in default frequency will be due to seasoning effects. In mortgages, for example, accounts in a given bucket defined by, say, FICO and LTV value, will exhibit default frequency variance having to do with a bulge in new accounts at any point in the observed time series.

Even if account age is appropriately handled in the context of a mean-variance approach, it is important how the PDs are measured when estimating AVCs. The mean-variance approach in Appendix 2 is meant to be utilized with true one-year PDs (and the logic of it dissipates if some other PD measurement is used). In particular, if annualized cumulative PDs are used, the observed mean default frequency will be higher and the observed variance lower, than if true one-year default frequencies are used. Other things equal, this will result in *lower* AVCs than if true one-year PDs are used in the mean-variance approach. If, on the other hand, the bank uses annualized cumulative PDs within its ASRF model, but uses AVCs that are estimated utilizing true one-year observed default frequencies within the mean-variance framework shown in Appendix 2, the bank will be overestimating the thickness of the tail of the one-year loss distribution.

Regarding the manner in which Basel has chosen its confidence interval, and the manner in which it has settled on AVCs for each asset class, there was not a consistent usage of annualized cumulative default rates. Rather, AVCs were chosen that reflected

- a) median implied AVCs associated with industry best-practice EC estimates, which such industry AVCs were deduced using an ASARF model *with one-year PDs* to “back into” the implied AVCs; and/or
- b) AVCs measured using the mean-variance approach (in which the mean and variance of one-year default frequencies were utilized to derive the AVCs).²⁴

Thus, using annualized cumulative default rates for any one bucket of loans within the Basel framework represents an inappropriate “stress test,” not a true minimum capital requirement.

²⁴ This was not the case for 1-4 family residential mortgages; see footnote 2 in the main text.

Table A-1
Average Global Cumulative Issuer-Weighted Default Rates from 1-20 Years
By Whole Letter Rating, %, 1970-2003²⁵

Rating	Year 1	Year 2	Year 3	Year 4	Year 5 (annualized)	Year 6	Year 7	Year 8	Year 9	Year 10
Aaa	0.00	0.00	0.00	0.04	0.12 (0.02)	0.20	0.29	0.39	0.50	0.62
Aa	0.02	0.03	0.06	0.15	0.24 (0.05)	0.34	0.43	0.53	0.60	0.68
A	0.02	0.09	0.23	0.38	0.54 (0.11)	0.72	0.91	1.12	1.35	1.59
Baa	0.20	0.57	1.03	1.62	2.16 (0.44)	2.69	3.24	3.80	4.42	5.10
Ba	1.26	3.48	6.00	8.59	11.17 (2.34)	13.53	15.44	17.37	19.22	21.01
B	6.21	13.76	20.65	26.66	31.99 (7.42)	36.56	40.79	44.21	47.19	50.02
Caa-C	23.65	37.20	48.02	55.56	60.83 (17.09)	65.53	69.36	73.65	75.94	77.91
Investment-Grade	0.08	0.23	0.44	0.70	0.96 (0.19)	1.23	1.50	1.78	2.09	2.42
Speculative-Grade	5.02	10.15	14.84	18.90	22.45 (4.96)	25.51	28.06	30.35	32.37	34.27
All Corporate	1.60	3.23	4.71	5.99	7.07 (1.46)	7.99	8.76	9.46	10.10	10.73

Rating	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19	Year 20
Aaa	0.74	0.88	1.03	1.12	1.21	1.31	1.43	1.55	1.55	1.55
Aa	0.77	0.93	1.12	1.37	1.51	1.67	1.91	2.12	2.43	2.70
A	1.86	2.10	2.37	2.61	2.94	3.35	3.78	4.23	4.74	5.24
Baa	5.83	6.63	7.44	8.27	9.12	9.91	10.71	11.45	12.09	12.59
Ba	23.01	25.16	27.24	29.16	30.88	32.81	34.53	36.13	37.38	38.56
B	52.24	54.09	55.95	57.77	59.21	60.37	60.73	60.73	60.73	60.73
Caa-C	80.23	80.23	80.23	80.23	80.23	80.23	80.23	80.23	80.23	80.23
Investment-Grade	2.78	3.16	3.57	3.97	4.41	4.86	5.34	5.80	6.27	6.69
Speculative-Grade	36.17	38.04	39.86	41.55	43.03	44.61	45.92	47.09	48.02	48.90
All Corporate	11.36	12.00	12.65	13.26	13.86	14.48	15.08	15.65	16.17	16.65

²⁵ Moody's 2004 Bond Default Study, Exhibit 29.

Appendix 2: Estimating Asset Correlation from a Time Series of Default Rates

Michael Pykhtin²⁶

Let us assume that we have a time series of T annual default rates for a segment of a retail credit portfolio characterized by credit score (and, possibly, by other parameters). Only the loans with the current credit score within the range that determines the segment are placed into the segment in the beginning of year t . The default rate DR_t is calculated as the ratio of the number of defaulted loans D_t in the segment to the total number of loans in the segment in year t , N_t

$$DR_t = \frac{D_t}{N_t} \quad (1)$$

It is critical for this methodology that the definition of credit score is not changed for the entire period of T years.

The sample mean default rate, μ_{DR} , and sample variance of default rate, σ_{DR}^2 , are calculated as

$$\mu_{DR} = \frac{1}{T} \sum_{t=1}^T DR_t \quad (2)$$

and

$$\sigma_{DR}^2 = \frac{1}{T-1} \sum_{t=1}^T (DR_t - \mu_{DR})^2 \quad (3)$$

If the typical number of loans in the segment is large enough, it is reasonable to assume that most of this sample variance comes from the variance of the systematic factor. The systematic part of the default rate variance in the Merton model, σ_{syst}^2 , is given by

$$\sigma_{syst}^2 = N_2[N^{-1}(PD), N^{-1}(PD), \rho_A] - PD^2 \quad (4)$$

where $N_2(\cdot, \cdot, \rho_A)$ is the bivariate normal cumulative distribution function with asset correlation ρ_A . If we use the sample default rate μ_{DR} as a proxy for the segment PD in Equation (4), we can equate the resulting σ_{syst}^2 to σ_{DR}^2 to obtain

$$N_2[N^{-1}(\mu_{DR}), N^{-1}(\mu_{DR}), \rho_A] - \mu_{DR}^2 = \frac{1}{T-1} \sum_{t=1}^T (DR_t - \mu_{DR})^2 \quad (5)$$

The estimate of the asset correlation can be obtained by solving Equation (5) for ρ_A numerically.

²⁶ KeyCorp.

Appendix 3

Institutions in the RMA Capital Working Group:

Bank of America	Bank of Montreal
Bank of New York	Capital One
CIBC	Citigroup
Comerica	Discover Financial Services
HSBC/North American Holdings	JPMorganChase
KeyCorp	MBNA
PNC Financial Services Group	RBC Financial
State Street	SunTrust
Union Bank of California	Wachovia
Washington Mutual Bank	Wells Fargo

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